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NOTES ON GEOGRAPHIC DISTRIBUTION

Coleoptera, Coccinellidae, *Harmonia axyridis* (Pallas, 1773): New record in Minas Gerais, southeastern Brazil

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ABSTRACT: *Harmonia axyridis* is a voracious aphid predator, which has been used in biological control programs in several countries. Due to its fast spreading, *H. axyridis* is becoming widely distributed across the world. Recently, it was detected in Viçosa, Minas Gerais, southeastern Brazil. This region shows climatic similarity to its native region and it may facilitate the establishment of *H. axyridis*. The species was found in some home gardens feeding on aphids and psyllids. The presence of the lady beetle in the state of Minas Gerais confirms its high spreading potential in Brazil, reinforcing the necessity for further studies on the possible impacts and control methods of its populations.

Harmonia axyridis is a multicolored lady beetle native from Asia. Its natural occurrence is in southern Siberia, from the Altai Mountains to the Pacific, including Manchuria, China and Japan, Korea and Mongolia (Dobzhansky 1933; Koch 2003).

This insect is an avid aphid predator (Koch 2003), and therefore it has been used in biologic control programs in several countries. It also feeds on Psyllidae (Iablokoff-Khnzorian 1982), mites (Cho *et al.* 1996), eggs and immature stages of Lepidoptera and Coleoptera (Krafsur *et al.* 1997; Stuart *et al.* 2002), and pollen (Berkvens *et al.* 2008).

According to Brown *et al.* (2008) *H. axyridis* may become the most widely distributed coccinellid in Europe, due not only to its introduction in several regions, but also for its fast spreading (Iperti and Bertand 2001). Nowadays, it occurs in Belgium, Czech Republic, France, German, Greece, Italy, Netherlands, Portugal, Spain, Switzerland, Austria, Denmark, Great Britain, Channel Islands, Liechtenstein, Luxemburg, Norway and Sweden (Brown *et al.* 2008). It was also reported for South Africa (Brown *et al.* 2008) and Egypt (El-Arnaulty *et al.* 2000).

In the USA, *H. axyridis* has been released for biological controls since 1916 (Gordon 1985; Koch 2003), where it was established, afterwards extending its distribution up to Canada and Mexico (Koch *et al.* 2006). At the end of 1990's, it was established in South America at Mendoza, and in 2001 in Buenos Aires, Argentina (Saini 2004). In Brazil *H. axyridis* was detected for the first time in 2002, in the south of the country, feeding on aphids that were attacking *Lagerstroemia indica* (Lythraceae) and *Pinus* spp. (de Almeida and da Silva 2002).

Recently, *H. axyridis* (Figure 1) was detected in Minas Gerais, southeastern Brazil. The species was found for the first time in 2006 at Viçosa (20°45'14" S and 42°52'55" W). Since then, it has been observed in some homegardens in Viçosa, downtown, under *Brassica oleracea* (Brassicaceae), *Citrus aurantifolia* (Rutaceae), *Leucaena leucocephala* (Fabaceae: Mimosoidae) and *Rosa* sp. (Rosaceae). In most of these plants, *H. axyridis* fed on aphids, while at *L. leucocephala* it was feeding on *Heteropsylla cubana* (Psyllidae).

Some samples were manually collected, labeled, mounted and sent to the Universidade Federal do Paraná, in order to be identified. Afterwards identified specimens were deposited at the Museu de Entomologia of the Universidade Federal de Viçosa. Adults of *H. axyrids* are oval and convex in shape, measure 5-8 mm and are larger than most of native lady beetle. They are highly color polymorphic with elytra ranging from pale yellow to black bearing 0-22 spots. The elytra usually display a wide "keel" at the apex. The head, antennae and mouthparts are generally straw-yellow but can also be tinged with black. The pronotum is straw-yellow with up to five black spots or with lateral spots usually joined to form two curved lines making an M-shaped mark or a solid trapezoid. The immature stage is elongate and adorned with strong tubercles and spines. The last larval stage is distinctively colored. The ground color is mostly black to dark bluish-grey, with a bright yellow-orange patch extending over the dorsolateral lobes of abdominal segments 1-5 on each side (Iablokoff-Khnzorian 1982).

FIGURE 1. *Harmonia axyridis* found in Viçosa, Minas Gerais, Brasil. Photo: Francisco Santana.

Brown *et al.* (2008) indicate that the time from the first settled register of the lady beetle and its expansion is variable. In countries where it was intentionally introduced, the period for expansion is longer when compared to countries where its colonization was spontaneous. According to the authors, this variation is due to the adaptation process for its expansion. In spontaneous colonized areas such as Brazil, its settlement is fast, because this process has already occurred.

The color pattern *H. axyridis* adults found in Viçosa is the succinea (Figure 2). The elytra coloration varies from yellow to red, with 0 to 21 black spots. The color may vary according to geographic distribution of the population, which is mainly related to climate factors (Soares *et al.* 2005). The succinea phenotype is generally associated to boreal forest, temperate broadleaf and mixed forest, temperate coniferous forest and tropical-subtropical moist broadleaf (Koch *et al.* 2006).

FIGURE 2. The succinea colour form of *Harmonia axyridis*. Photo: Francisco Santana.

The vegetation of Viçosa is classified as tropical semideciduous forest (Veloso et al. 1991) and the climate type is mesothermic humid, classified as type Cwa, with rainy summers, dry winters, and the mean temperature of the warmest month higher than 22 °C (Vianello and Alves 1991). Apparently, the south and southeast of Brazil, locations for which *H. axyridis* was registered, show climatic similarity to its native region (Koch *et al.* 2006). This suggests the possibility of establishment of *H. axyridis* in these regions, although there are regions in Brazil with higher similarity to the native biome of this species, such as the north of the country and Brazil's seaboard because of the predominance of tropical moist forests.

H. axyridis may displace native predator species by intraguild predation or resource competition because of its voracity in feeding (Koch 2003). Besides, it causes discomfort when they are aggregated in urban buildings during the winter, and may cause allergy in humans (Kovach 2004).

The presence of the lady beetle in the state of Minas Gerais confirms its high spreading potential in Brazil, reinforcing the necessity for further studies on the possible impacts and control methods of its populations.

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